グリーンランド、カナック氷河のクリオコナイト粒の発達プロセスにおけるバクテリア相の変化

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Bacterial diversity changes in formation process of cryoconite granule from Qaanaaq Glacier, Greenland

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On the glacier surface, psychrophilic microorganisms forms brown-black color small (1mm diameter) granule called cryoconite. From microscopic observation, main structures of cryoconite are formed by filamentous cyanobacteria aggregation and these keep organic material, other microorganisms and mineral particles. Cryoconite are widely distributed on the ablation area of glacier and ice sheet in various parts of the world, and reduce the albedo and accelerate the melting of ice surface. Despite of importance of cryoconite for glacial melting effect, microbiological formation process of cryoconite is not well understand. Therefore, in order to understand microbial diversity changes during formation process, we compared microbial diversities in 8 different size of cryoconite.

In July 2012, on the middle of Qaanaaq Glacier located in Northeastern parts of Greenland, we collected the cryoconite from 5 different altitude site (QA1-5). Cryoconite from each sampling site are by each sizes (Size 1: 30-100 μm, Size 2: 100-250 μm, Size 3: 250-500 μm, Size 4: 500-750 μm, Size 5: 750-1000 μm, Size 6: over 1000 μm) using niron mesh filter. All samples of DNA are extracted and amplified by PCR using primer set 27F and 1429R for bacterial 16S rRNA gene.
For Size 1 and Size2, total 1000 sequences are retrieved and 784 seqs are clustered into major 11 OTU. Sources of relatives of all OTU are supraglacier environment. All of these would be cold-adapted bacteria. 5 OTU closely related to *Hymenobactor, Granulicella* and *Frigobacterium* are found from all 5 sampling sites. On the other hand, 1 OTU related to cyanobacteria: *Phormidium priestleyi* is found only from cryoconite developed site (QA3 and QA4). *Phormidium pristleyi* known as filamentous species are detected only in site where cryoconite granules developed. Because main structure of cryoconite is composed by filamentous cyanobacteria, this OTU would be essential for begining of cryoconite development.